IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

WILSON et al.

Atty. Ref.: 117-347

Serial No. 09/787,633

Group: 1635

Filed: July 10, 2001

Examiner: Angell

For: TREATMENT OF INFECTION

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October 25, 2002

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

RESPONSE UNDER RULE 116

This is in response to the Official Action mailed on July 25, 2002.

Reconsideration of the application is requested.

Claims 12 and 13 remain pending.

The sole rejections made in the Official Action are a rejection under 35 USC 112, second paragraph and a rejection under 35 USC 112, first paragraph. Both rejections concern the term *"ycf 24* gene" used in the claims. Both rejections are new rejections made for the first time in the present Official Action, and all previous rejections have been withdrawn.

Applicants respectfully submit that both rejections are unfounded, and the Examiner is requested to reconsider them in light of the following submissions.

The term "*ycf 24* gene" particularly points out and distinctly claims the subject matter which the Applicants regard as their invention, as required by 35 USC 112 , second paragraph. The *ycf 24* gene was clearly recognized by persons ordinarily skilled in the art at the filing date, and the term "*ycf 24* gene" had a clear and distinct meaning to such persons. As evidence of this, Applicants attach five literature references in which the authors use the term " *ycf 24* gene", namely:

Kowallik *et al* (1995) Plant Molecular Biology Reporter, 13, 336-342;
Stirewalt *et al* (1995) Plant Molecular Biology Reporter, 13, 327-332;
Douglas and Penny (1999) J. Mol. Evol. 48, 236-244;
Reardon and Price (1995) Plant Molecular Biology Reporter, 13, 320-326; and
Denny *et al* (1998) Protist, 149, 51-59.

(These documents, which are submitted in support of the present arguments, are listed on the attached PTO 1449 Form and return of an initialed copy of the same, or return of a PTO 892 Form listing the references, is requested as acknowledgement of the Examiner's consideration of the references. No fee are believed to be required for consideration of these references. These references are being submitted as evidence, in support of the applicants traversal of these new rejections.)

Kowallik *et al* describes the chlroplast geneome of a chlorophyll-containing alga, *Odontella sinensis* and reports that one of the genes in the genome is "*ycf 24* gene" (see Figure 1, page 337, second line from the bottom and page 340).

Stirewalt *et al* describes the nucleotide sequence of the cyanelle genome from *Cyanophora paradoxa* and reports that the genome contains *ycf 24* (see the fourth row in page 329).

Douglas and Penny describes the complete sequence of the plastid genome of the cryptophyte alga, *Guillardia theta*, and reports that it contains *ycf 24*. Douglas and Penny also confirms that *ycf 24* has been identified in other photosynthetic lineages (see Table 1 on page 239).

Reardon and Price is a review article about the sequencing of plastid genomes of non-green algae and confirms that *ycf 24* has been recognized in such genomes (see the 5th item on page 326).

Denny *et al* discusses the evidence for a single origin of the 35kB plastid DNA in Apicomplexans and notes that the *ycf 24* gene is highly conserved in the plastid across the different species (see page 53, right column, under the heading "The ORF470 Region").

The above-cited references show that persons skilled in the art consider and considered the term "*ycf 24*" to be clear enough to be used in published scientific articles. They also show that the "*ycf 24* gene" has a highly conserved sequence across species and that this allowed persons skilled in the art to recognize the gene in a

variety of genomes; the references show that, when a genome from a new species was sequenced, any *ycf 24* gene was readily identified by its sequence.

The Examiner argues that the definition of the *ycf 24* gene given in the specification is not clear. Applicants respectfully submit that this argument is not well founded.

For example, the Examiner states that it is unclear if the *ycf 24* gene is SEQ ID No. 1, 2, 3 (Official Action dated July 25, 2002 (Paper No. 17), page 3, lines 7-8). However, the specification in fact makes entirely clear that the *ycf 24* gene may have any of SEQ ID No: 1 (the sequence of the malaria parasite *Plasmodium falciparum*), SEQ ID No: 2 (the sequence of *Synechocystis* PCC6803) and SEQ ID No: 3 (the sequence of *E.coli*). See page 4, lines 32 -34 of the specification, where it is stated that the *ycf 24* gene product is generally "one which can be expressed from the coding region of: (a) the polynucleotide sequence of SEQ ID NO: 1, 2, or 3 ...".

The Examiner also argues that it is unclear if the *ycf 24* gene is a polynucleotide which binds to SEQ ID No: 1, 2 or 3 (Paper No. 17, page 3, lines 7-8). However, the specification in fact makes entirely clear that the *ycf 24* gene may be encoded by "polynucleotide which can selectively hybridize to the coding region of" SEQ ID No: 1, 2 or 3 (see page 5, lines 2-3 of the specification). An example of hybridization conditions is given at page 5, lines 6-9.

The Examiner also states that it is not clear if the *ycf 24* gene is a malaria gene, a red algal gene, a bacterial gene or an *E.coli* gene (Paper No. 17, page 3, lines 7-9). However, the specification in fact makes entirely clear that the gene is found in all these organisms. For example, the specification makes clear at page 4, lines 26-31 that the organism may be "*Plasmodium falciparum* [a malaria parasite] ... an alga ... a bacterium ... or *E.coli*".

The claims are definite and withdrawal of the Section 112, second paragraph, rejection is requested.

Turning now to the rejection under 35 USC 112, first paragraph, the Examiner argues that the specification does not contain an adequate "written description" of the *ycf 24* gene. Applicants respectfully submit that this rejection is without foundation.

It is important to note that the *ycf 24* gene was described in the literature prior to the filing date and that Applicants are <u>not</u> claiming a new gene. Rather, Applicants are

claiming a screening method which uses an old gene. The screening method is based on Applicants' finding that the old gene, the *ycf 24* gene, is essential for the growth of organisms which cause disease and that inhibitors of the gene product may therefore be useful in treating disease.

Despite the fact that *ycf 24* gene was already described in the literature, Applicants included a further exemplified description of the gene in the patent application. For example, Applicants included the sequences of the gene in *Plasmodium falciparum, Synechocystis* PCC6803 and *E.coli* (see SEQ ID Nos: 1, 2 and 3). Thus, the application does not leave the ordinarily skilled reader in any doubt as to the gene which is the subject of the application and claims.

The Examiner states that "applicant has express possession of only SEQ ID NOS: 1-3, in a genus which comprises hundreds of millions of different possibilities, considering every possible variant or fragment of SEQ ID NOs: 1-3". Thus, Applicants could presumably have fulfilled the requirement for a written description as applied by the Examiner by including hundreds of millions of sequences in the application. However, it would clearly be neither practical nor sensible for a patent application to include such a large number of sequences in order to provide a written description of a gene that was in any event already described in the scientific literature. Furthermore, including hundreds of millions of sequences in the patent application would contravene the requirement of 35 USC 112 for the written description to be "concise".

As pointed out by the Examiner, the written description guidelines only require a satisfactory disclosure of a "representative number" of species. As mentioned above, the present application describes three specific species within the genus, namely the sequences of *Plasmodium falciparum*, *Synechocystis* PCC 6803 and *E.coli* (SEQ ID No: 1, 2 and 3). In the present case, the description of these three species is more than adequate to demonstrate to one of ordinary skill in the art that the Applicants' were in possession of the claimed invention at the time the application was filed; it is more than adequate to leave the ordinarily skilled reader in no doubt as to which gene is the subject of the application and claims, and inclusion of any further sequences in the application would simply add to its length without serving any practical or useful purpose.

The three cases cited by the Examiner on pages 4 and 5 of the Paper No. 17 are, with due respect, of little relevance to the present case because they are all based upon facts fundamentally different from the facts of the present case. In the *Vas-Cath Inc. v. Mahurkar* case, the Court stressed the fact-specificity of the "written description" issue. The Court quoted from an earlier case in which a Court stated that "What is needed to meet the description requirement will necessarily vary depending on the nature of the invention claimed", that "each case must be decided on its own facts" and that "the precedential value of cases in this area is extremely limited".

This limited precedential value of earlier cases is apparent when the facts of *The Regents of the University of California v. Eli Lilly and Co* are considered. One of the patents in issue in that case described the cloning of cDNA sequences encoding rat insulin. However, claim 1 of the patent covered a recombinant plasmid including the cDNA sequence of any vertebrate; claim 1 was directed to "A recombinant plasmid replicable in procaryotic host containing within its nucleotide sequence a subsequence having the structure of the reverse transcript of an mRNA of a vertebrate, which mRNA encodes insulin". The Court found that a description of rat insulin cDNA is not a description of the broad class of vertebrate insulin DNA.

Thus, in *The Regents of the University of California v Eli Lilly* case, the Court decided that a claim to a new DNA molecule requires a description of the DNA molecule, e.g. by reference to its sequence. However, that is not the issue in the present case. In the present case, a new DNA molecule is not being claimed. The presently claimed invention has nothing to do with identifying a new DNA sequence. On the contrary, the invention concerns a new method of using an old gene product. Since the sequence of the gene was already known in the literature, the amount of written description required to define it in a distinct manner is relatively limited, and the present application contains more than enough description to leave the ordinarily skilled reader in no doubt as to which gene is the subject of the application.

Withdrawal of the Section 112, first paragraph, rejection is requested.

It is respectfully submitted that the application is in condition for allowance, and a notice to that effect is requested.

Respectfully submitted,
NIXON & VANDERHYE PC

By: _____
B.J. Sadoff
Reg No. 36,663

1100 North Glebe Road
8th Floor
Arlington, VA 22201-4714
Tel: (703) 816 4000
Fax: (703) 816 4100